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Indian Standard
METHODS FOR SAMPLING OF OILSEEDS

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Indian Standard

METHODS FOR SAMPLING OF OILSEEDS

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Indian Standard

METHODS FOR SAMPLING OF OILSEEDS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 11 August 1967, after the draft finalized by the Oils and Oilseeds Sectional Committee had been approved by the Chemical Division Council and the Agricultural and Food Products Division Council.

0.2 Practically all oilseeds are evaluated and sold on the basis of samples and results of analysis of these samples. If the samples obtained are not representative, any amount of care and precision in analysis will not help in ascertaining true quality of the oilseeds. Besides, inaccurate sampling could lead to misunderstanding, delay and unnecessary financial adjustments. It is, therefore, highly imperative to follow scientific procedures for obtaining representative samples of oilseeds for analysis. The sampling methods as given in this standard are intended to ensure such a representativeness of the derived sample.

0.3 This standard is based on the trade practices followed in the country in this field. Consideration has also been given to the work done on this subject by ISO/TC 34/SC 2 Oleaginous Seeds and Fruits Subcommittee, of the International Organization for Standardization (ISO).

1. SCOPE

1.1 This standard prescribes the methods for sampling, number of tests to be performed and the criteria for conformity of oilseeds, including the oil bearing fruits.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Small Oilseeds — Sesame, mustard, poppy, rape, linseed, hemp, cottonseed and other oilseeds in the same size-range.

2.2 Medium Oilseeds — Castor, palm kernel, groundnut, mahua, soybean and other oilseeds in the same size-range.

2.3 Large Oilseeds — Copra and other oilseeds in the same size-range.

2.4 Consignment — The entire quantity of oilseeds received at one time under a particular contract.

IS : 4115 - 1967

2.5 Lot — The quantity of oilseeds in a consignment belonging to the same species, variety, type, grade and source.

2.6 Sub-Lot — The quantity of oilseeds in each of the parts into which the lot is divided for the purpose of sampling.

2.7 Increment — The quantity of oilseeds taken by a sampling device at one time.

2.8 Gross Sample — The quantity of material obtained by aggregating and mixing together all the increments drawn from a sub-lot.

2.9 Laboratory Sample — The quantity of oilseeds obtained for laboratory testing by reducing a gross sample by following a specified procedure.

2.10 Composite Sample — The quantity of oilseeds obtained by mixing together equal quantities of the material from each of the gross samples representing the sub-lots into which the lot has been divided.

2.11 Moisture Sample — The laboratory sample intended for the determination of moisture.

3. FORMATION OF LOTS AND SUB-LOTS

3.1 Lot — The consignment shall be broken into lots such that each lot consists of oilseeds belonging to the same species, variety, type, grade, source, and the year of production as far as possible.

3.2 Sub-Lot — The object of dividing a lot into a suitable number of sub-lots is only to facilitate the drawing of representative gross samples rather than to indicate its physical division. However, if the lot admits of a distinct qualitative division, each sub-lot should be composed of homogeneous material, otherwise sub-lots may be formed only on quantitative basis. Depending on the size and uniformity of the lot the number of sub-lots may be 2 or more, preferably in accordance with Table 1 or Table 2. In case of unbagged material sub-lots may be identified by demarcation lines on the surface.

TABLE 1 NUMBER OF SUB-LOTS FOR OILSEEDS IN BAGS

NUMBER OF BAGS IN A LOT	MINIMUM NUMBER OF SUB-LOTS
Up to 300	2
301 „ 1 000	3
1 001 „ 3 000	4
3 001 and over	5

TABLE 2 NUMBER OF SUB-LOTS FOR OILSEEDS IN BULK

(Clause 3.2)

WEIGHT OF OILSEEDS IN A LOT	MINIMUM NUMBER OF SUB-LOTS
Up to 30	2
31 „ 100	3
101 „ 300	4
Over 300	5

4. SAMPLING APPARATUS

4.1 For drawing representative samples of oilseeds, suitable sampling instruments shall be used. The sampling instruments that will be useful for drawing such samples are given in Appendix A.

5. SAMPLE CONTAINERS

5.0 All the samples shall be kept in suitable containers so as to preserve, as far as possible, all the characteristics till the time of their use in testing. They shall also carry labels with full particulars for identification.

5.1 Laboratory samples with the exception of moisture samples shall be enclosed in cloth bags conforming to the requirements specified in Appendix A of IS : 2814-1964*.

5.2 The samples for the moisture determination shall be first placed in polyethylene bags conforming to the requirements specified in Appendix B of IS : 2814-1964*. The polyethylene bags shall then be heat-sealed and placed in a close fitting cloth bag.

5.3 Labelling — Before closing the cloth bags, a label shall be placed in it which shall contain the following information :

- a) Name of the material;
- b) Contract and consignment;
- c) Lot number and sub-lot number;
- d) Sample description and number;
- e) Variety, grade and type;
- f) Place and date of sampling;
- g) Name and signature of the person who sampled; and
- h) Name of supplier.

*Methods for sampling of cereals and pulses.

6. SAMPLING REQUIREMENTS

6.1 The consignment shall be divided into lots according to the considerations specified in **3.1**.

6.2 The conformity of the material to the requirements of the relevant Indian Standard specification shall be ascertained separately for each lot in accordance with **11** and **12**. For this purpose the lot shall be divided into sub-lots (*see 3.2*).

6.3 Sampling shall be done separately from each sub-lot according to **7** while sampling from wagons, **8** when sampling from ships, and **9** when sampling from stockpiles or warehouses. One representative gross sample shall be obtained for each sub-lot. Thus there will be as many gross samples as the number of sub-lots in a lot. Thus there will be as many gross samples as the number of sub-lots in a lot. The samples for tests shall be prepared from gross samples (*see 10*).

6.4 Laboratory samples and moisture samples shall be transferred to sample containers and labelled properly for identification according to **5.3**.

6.5 To achieve randomness in selection of bags as required in **7**, **8** and **9**, use shall be made of random number tables as far as possible. When random number tables are not available, the following procedure may be adopted :

‘ Starting from any bag count them in one order as 1, 2, 3, ..., up to r , r being the integral part of N/n , where N is the total number of bags and n the number of bags to be selected. Every r th bag thus counted is withdrawn to constitute the sample. ’

6.6 As far as possible the oilseeds shall be sampled during movement while loading and unloading.

6.7 Sampling should be carried out in such a manner as to protect the samples, the sampling instrument, the sample containers and the material being sampled from adventitious contamination.

6.8 Special care shall be taken to ensure that the sampling apparatus and sample-containers are clean, dry and free from foreign matter.

6.9 Sampling shall be done by a person agreed to between the purchaser and the supplier and in the presence of the purchaser (or his representative) and the supplier (or his representative).

7. SAMPLING FROM WAGONS DURING LOADING OR UNLOADING

7.1 For the purpose of sampling all the wagons in a lot shall be divided into a suitable number of sub-lots of approximately equal weight in accordance with the requirements of Table 1 or Table 2 as applicable.

7.1.1 One gross sample shall be drawn from each of the sub-lots so that there are as many gross samples as the number of sub-lots into which a lot is divided.

7.2 In order to get a representative gross sample, the oilseeds shall be sampled, as far as possible, in steady motion during loading or unloading. As a first step a minimum of 25 percent of wagons shall be selected at random from the sub-lot.

7.2.1 In the case of bagged oilseeds, the number of bags to be selected from each sub-lot shall be in accordance with Table 3.

TABLE 3 SCALE OF SAMPLING FOR BAGGED OILSEEDS

(Clauses 7.2.1 and 9.3)

NUMBER OF BAGS IN THE LOT	NUMBER OF BAGS TO BE SAMPLED FOR	
	Small Oilseeds	Medium and Large Oilseeds
Up to 50	5	8
51 „ 100	8	13
101 „ 150	13	20
151 „ 300	20	32
301 and above	32	50

7.2.1.1 The bags shall be evenly distributed over the selected wagons with a view to determining the necessary number of bags that shall be collected from each of the selected wagons of the sub-lot. The requisite number of bags shall be collected at regular intervals at the time of loading or unloading. From each of the selected bags one increment shall be taken with the help of a suitable sampling instrument (see Appendix A).

7.2.2 In the case of unbagged oilseeds a minimum of 50 increments shall be collected from each sub-lot. These increments shall be uniformly spread over the selected wagons, and shall be drawn at regular intervals at the time of loading or unloading.

7.3 All the increments from the same sub-lot shall be thoroughly mixed and blended to constitute a gross sample to represent a sub-lot. The minimum size of the gross sample shall be at least 2 kg for small oilseeds, 6 kg for medium oilseeds and 10 kg for large oilseeds. If the gross sample as obtained above is less than this minimum quantity, additional increments shall be drawn from the sub-lot so as to make up the required quantity. The manner of drawing these increments shall be the same as those described in **7.2.1** or **7.2.2**.

8. SAMPLING FROM SHIPS DURING LOADING OR UNLOADING

8.1 The entire quantity of oilseeds in a ship shall be divided into a suitable number of sub-lots of approximately equal weight in accordance with Table 1 or Table 2.

8.1.1 One gross sample shall be drawn from each of the sub-lots so that there will be as many gross samples as the number of sub-lots into which the lot has been divided.

8.2 Sampling of oilseeds from ships shall be carried out as far as practicable when the material is in motion. The requisite number of bags or increments shall be drawn during loading or unloading of the ship in accordance with **7.2.1** for bagged oilseeds or **7.2.2** for unbagged oilseeds.

8.3 The same treatment as explained in **7.3** shall be given to the increments selected in **8.1** and **8.2**.

9. SAMPLING FROM STOCKPILES OR WAREHOUSES

9.1 For the purpose of sampling, the quantity of oilseeds in a stockpile or warehouse shall be divided into a suitable number of sub-lots of approximately equal weight as specified in Table 1 or Table 2.

9.1.1 One gross sample shall be drawn from each of the sub-lots so that there will be as many gross samples as the number of sub-lots into which the lot has been divided.

9.2 As far as practicable the oilseeds shall be sampled when the material is in motion that is, while making or breaking stockpile or while storing or removing oilseeds from the warehouse. The number of bags or increments to be selected and the method of collecting them shall be in accordance with **7.2.1** or **7.2.2**.

9.3 In the case of bagged oilseeds in stationary stockpiles, the number of bags to be selected from a sub-lot shall be as specified in Table 3. These shall be chosen randomly from different layers of the stockpile. For easy accessibility of all the bags in a sub-lot, it may be more practicable to restrict the height of the stockpile to 1.5 m or so. From each of the bags so chosen, an increment shall be collected with the help of a suitable sampling instrument.

9.4 In the case of unbagged oilseeds in stationary stockpiles, the sub-lots should be indicated by suitably marking the line of demarcation on the surface of a lot. The surface of each of the sub-lot shall then be levelled and from the various parts randomly chosen from the surface, a minimum of 50 increments shall be drawn with the help of suitable sampling instrument. As in the earlier case it would be advisable to have stockpile of less than

1.5 m high so that the sampling instrument can probe deep enough to obtain a representative sample.

9.5 The same treatment as explained in 7.3 shall be given to the increments selected in 9.3 and 9.4. The manner of drawing these increments shall be the same as those described in 7.2.1 or 7.2.2 if the material is in motion or as in 9.3 or 9.4 if the material is stationary.

10. REDUCTION OF GROSS SAMPLE

10.1 Each gross sample shall be reduced suitably for obtaining a set of three laboratory samples and three moisture samples. The minimum weight of each of the laboratory and moisture samples for different types of oilseeds shall be as given in Table 4.

TABLE 4 WEIGHTS OF LABORATORY AND MOISTURE SAMPLES

OILSEEDS	MINIMUM WEIGHT OF EACH OF THE	
	Laboratory Sample	Moisture Sample
(1)	(2)	(3)
	g	g
Small	200	150
Medium	600	150
Large	1 000	250

10.1.1 The laboratory and moisture samples shall be bagged in suitable sample containers (*see* 5) after proper labelling (*see* 5.3). One laboratory sample shall be marked for the purchaser, another for the supplier, and the third for reference in case of dispute. The three moisture samples shall also be demarcated in a similar manner.

11. NUMBER OF TESTS

11.1 Testing for oil and moisture contents shall be done separately for each sub-lot. For testing moisture content use shall be made of the moisture sample prepared especially for this purpose. For testing oil content a portion of laboratory sample shall be used.

11.2 Testing for all other requirements shall not be done for each sub-lot separately but for the lot as a whole. For this purpose a composite sample to represent the lot shall be prepared by taking adequate but equal quantities of material from all the laboratory samples representing the sub-lots into which the lot has been divided. All the requirements other than oil and

moisture contents shall be tested on the composite sample after thorough mixing.

12. CRITERIA FOR CONFORMITY

12.1 In respect of oil and moisture contents the lot shall be declared to be in conformity to the specified requirements if each sub-lot has been found to satisfy the requirement after testing according to **11.1**.

12.2 In respect of all the other requirements the lot shall be declared to be in conformity to the specified requirements, if the composite sample representing the lot has been found to satisfy all these requirements when tested according to **11.2**.

APPENDIX A **(Clauses 4.1 and 7.2.1.1)** **SAMPLING INSTRUMENTS**

A-1. SLOTTED-TUBE SAMPLER

A-1.1 The slotted-tube type of sampler is well suited for drawing representative samples from bulks and from bags of oilseeds. The extracted sample in various slots is considered representative of the entire cross-section. It is particularly useful when the uniformity of oilseeds from point to point is in doubt. It is more suited for small and medium sized oilseeds. It consists of two metallic tubes having several oval slots, fitted one inside the other, and free to rotate. After inserting the sampler into the oilseeds, the inner tube is rotated so that the slots of the two tubes coincide and an amount of oilseeds is deposited into the inner tube. By rotating it further, all slots of the inner tube are closed and the sampler is withdrawn from the oilseeds. This type of sampling is usually provided with a locking arrangement so that the tubes are held together in any desired position. For further details refer to IS : 2815-1964*.

A-1.1.1 The slotted-tube sampler is inserted horizontally into the oilseeds in the closed position with slotted part facing downward. When the sampler has been inserted in the desired position, it is to be turned to bring the slotted part to face upwards, and then brought to open position. The opened slots are filled with oilseeds. It is brought back to the closed position, turned to bring the slotted face downwards and then taken out keeping it horizontally and not allowing the samples taken out of the different slots to get mixed up. The variation in quality from slot to slot is taken as an indication of heterogeneity of the oilseeds across the cross-section sampled.

A-2. PARKHI TYPE SAMPLER

A-2.1 The *PARKHI* type sampler is used for drawing representative samples from bagged oilseeds. It is suited for sampling of all oilseeds with the

*Specification for slotted-tube sampler.

exception of copra only. It is manufactured from mild steel sheet bent to a semi-circular section with a pointed end and is provided with a suitable wooden handle. The pointed end is inserted into bags for drawing the sample. For further details for a *PARKHI* type sampler refer to IS : 2816-1964*.

A-2.1.1 When a *PARKHI* type sampler is used it is inserted in the diagonal position and the sample is collected at the other end by gently turning.

A-3. THERMO-SAMPLER

A-3.1 The thermo-sampler is a device by which a sample is taken from the bulk storage with simultaneous recording of temperature at different depths. This device is used in oilseeds storage godowns where bulk storage is practised. With the exception of copra, this type of sampler can be used for oilseeds of all sizes. For further details for a thermo-sampler refer to IS : 2821-1964†.

A-3.1.1 The thermo-sampler is pushed to the desired depth. An upward jerk is given and after allowing about 1 minute to fill, the sampler is pulled out. Whenever the record of temperature is considered necessary, the temperature is observed as soon as the sampler is taken out.

A-4. OTHER SAMPLERS

A-4.1 There are a number of other sampling apparatus used by the oilseeds trade in India, such as deep bin-probe, pelican-type sampler, scoop, sack-type sampler, etc.

A-4.1.1 The deep bin-probe can be used only to a depth of 1.5 m in sampling from heaps or other bulks of oilseeds. It is inserted at an angle in the closed position and is opened when the desired depth is reached. After allowing about half a minute to collect the sample the tube is closed and pulled out.

A-4.1.2 Pelican-type sampler, scoop and sack-type sampler can be used when the oilseeds are in motion and the increments are required to be picked up at regular intervals depending upon the rate of flow.

Specification for grain sampler (*PARKHI* type).

†Specification for thermo-sampler.

(Continued from page 2)

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